

Remarks

35.U.S.C §103(a) Claim Rejections

Claims 31, 51, and 52 and dependent claims

Claims 31 to 33, 34 and 45 were rejected under 35.U.S.C §103(a) as being unpatentable over Gray (US 4,794,248 A) in view of Masotti (WO 07/77447 A1).

Regarding Claims 31 and 33, in the Office Action dated 4 March 2009, the Examiner equated the “infrared red transmitter and/or receiver elements with the sensors (13 and 23) of Gray and the “array of illuminable elements” with the emitters (12 and 22) on the basis that the sensor of Gray (“receiver”) must be “sensitive to the radiation of the emitters.” Further, in the response to the Applicant’s previous arguments the Examiner highlights potential issues with the use of the “and/or” term and the term “illuminable elements” as leading to use of the “*broadest reasonable interpretation.*”

Accordingly, the Applicant understands that the Examiner interpreted the claims to impose no limitation on the “receiver elements” to be infrared receiver elements, or on the illuminable elements to be emitters of visible light.

Amendment

Recognizing that the Examiner’s interpretation has arisen, in part, because of the manner of which the “and/or” term is used, Claims 31 & 33 have been amended to remove the recitation of “and/or receiver elements” thereby directing each claim to the single case in which the edge device comprises an elongate array of infrared **transmitter** elements capable of emitting infrared radiation and an elongate array of illuminable elements capable of emitting visible light.

Further, recognizing the Examiner’s interpretation has arisen, in part, because of the manner in which the “illuminable elements” term is used, Claims 31 & 33 have been amended to make it clear that the illuminable elements are capable of emitting visible light.

In view of the amendments to Claims 31 & 33, the complementary edge device comprising infrared **receiver** elements and illuminable elements capable of emitting visible light is now claimed in independent form in new Claims 51 and 53. Accordingly, in Claim 51, the receiver elements can no longer be interpreted, in the words of the Examiner, as being “*sensitive to the radiation of the emitters [illuminable elements].*”

The remaining possibility of an edge device comprising an elongate array of infrared transmitter elements, infrared receiver elements and illuminable elements capable of emitting visible light has now been covered, in independent form, in new Claims 52 and 54.

Comments on Cited Documents with respect to Amended Claims 31 and 33 and New Claims 51 and 52

Claims 31 & 33

The Applicant submits that the subject matter of amended Claims 31 and 33 would not have been obvious to one skilled in the art because neither Gray nor Masotti teach an edge device comprising both infrared transmitter elements and one or more illuminable elements capable of emitting visible light, and because both Gray and Masotti disclose embodiments which one skilled in the art would have understood to render the claimed arrangement unnecessary and/or undesirable.

Gray

Gray discloses a pair of elevator doors, 10, 20 with corresponding closure edges 11, 21, each of which is respectively provided with an array of emitters 12, 22 and an array of sensors 13, 23. Gray teaches that the "*emitters may be light bulbs, LED devices or any radiation emitting device; for example, an infrared emitter*" (Column 2, lines 54-55).

Gray does not, however, teach an edge device for a powered door comprising both infrared transmitter elements (e.g. for object detection purposes) and illuminable elements capable of emitting visible light (e.g. for providing visible indications to a user).

Furthermore, as acknowledged by the Examiner, where the emitters referred to in Gray are sources of *visible* light (e.g. light bulbs), Gray does not teach these emitters being arranged so as to be visible to persons approaching the door (as previously recited) or "*such that the visible light is visible to persons approaching the door*" (as recited in Claims 31 and 33 as amended).

In all the embodiments disclosed by Gray all the emitters 12, 22 use the same technology (e.g. visible or infrared). Further, Gray discloses an example in which the emitters 12, 22 emit visible light ("*emitters may be light bulbs, LED devices*" - Column 2, lines 54 - 55) and the sensors 13, 23, by necessity detect the visible light ("*the sensors may be any device that is sensitive to the radiation of the emitters*" - Column 2, lines 59 - 60). Accordingly, if one skilled in the art were to consider, in the words of the Examiner, modifying "*the invention of Gray such that the illumination source was visible to people ...*" (which the Applicant does not accept) they would have to have modified the embodiment which uses an emitter of visible light (and accordingly sensors of visible light). Since this embodiment does not, by definition, require the presence of

an infrared transmitter, the skilled person would have considered the inclusion of such a device to be surplus to requirements, would have known that the inclusion of an infrared transmitter would add cost, and would therefore have considered such an arrangement to be undesirable.

Masotti

Masotti, does not disclose an edge device for a powered door but does disclose an optical source and receiver which may use emitters in the visible or infrared range (page 5, line 23) and complementary optical sensors/receivers. As correctly pointed out by the Examiner, the optical source can also be used independently of the optical receiver *"to meet specific lighting requirements."* As noted by the Examiner, however, Masotti does not specify the presence of an optical source for lighting purposes (i.e. emitting visible light) together with an infrared transmitter.

The Applicant submits that one of ordinary skill in the art reading Masotti would understand that if an optical source of visible light (e.g. an illuminable element) were used *"to meet specific lighting requirements"* a further optical source of invisible infrared light (e.g. a infrared transmitter) was not merely unnecessary but also undesirable based on the teaching of Masotti.

Specifically, Masotti teaches the possibility of a using a complementary receiver capable of receiving the visible light for detection purposes thereby providing for both detection and *"lighting requirements"* without the need for adding a separate infrared source/sensor pair (at extra cost). Accordingly, a skilled person reading Masotti would infer that the complimentary infrared receiver/emitter pair required for providing infrared detection was unnecessary and therefore undesirable given the additional costs that would necessarily be involved in installing both infrared technology and visible light technology.

Accordingly, neither Gray nor Masotti teach an edge device comprising both infrared transmitter elements and illuminable elements capable of emitting visible light and, indeed, teach arrangements which one of ordinary skill in the art would have understood to render the subject matter claimed in amended Claims 31 and 33 to be unnecessary and undesirable. The subject matter of Claims 31 and 33 would not, therefore, have been obvious to one skilled on the art.

Claims 51 & 53

The Applicant submits that the subject matter of Claims 51 and 53 would not have been obvious to one skilled in the art because neither Gray nor Masotti teach an edge device comprising both infrared receiver elements and illuminable elements capable of emitting visible light, and because both Gray and Masotti teach that, for detection purposes emitters of one type of radiation must be accompanied by receivers of the same type of radiation thereby rendering the inclusion of an infrared receiver with a source of visible light unnecessary.

As one skilled in the art would understand from the teaching from both Gray and Masotti, for object detection purposes, where an emitter of a particular type of radiation is used (e.g. in the edge device of a powered door), it should be partnered by a corresponding receiver (e.g. in the edge device of the opposite door) capable of receiving that type of radiation (i.e. "*the sensors may be any device that is sensitive to the radiation of the emitters*" - Gray, Column 2, lines 59 - 60). Accordingly, one skilled in the art would not have found it obvious to modify the invention of Gray to include infrared receiver elements (which cannot receive visible light) with illuminable elements capable of emitting visible light because such an arrangement simply would not work for detection purposes.

Accordingly, neither Gray nor Masotti teach an edge device comprising both infrared receiver elements and one or more illuminable elements capable of emitting visible light and, indeed, teach arrangements which one of ordinary skill in the art would have understood to require an emitter and receiver of the same type of radiation. The subject matter of Claims 51 and 53 would not, therefore have been obvious to one skilled on the art.

Claims 52 & 54

Turning now, for completeness, to Claims 52 and 54, this includes all the features of both Claim 31 and Claim 51. Accordingly, for the reasons discussed above, the subject matter of Claims 52 and 54 would also not have been obvious to one skilled on the art based on the teaching of Gray and/or Masotti.

Claims 32 to 45

Claims 32 and 45 include all the features of Claim 31 or Claim 33 at least and are therefore not obvious for the same reasons discussed for Claims 31 and 33.

Claim 46 and dependent Claims

Claim 46 was rejected under 35.U.S.C §103(a) as being unpatentable over Gray (US 4,794,248 A) in view of Trett (US 5,420,430). Although, in the argumentation, the Examiner also relies on combination with Masotti (WO 07/77447 A1).

The Applicant agrees with the Examiner that Gray and Trett (and Masotti) do not disclose an illuminable element comprising a light-spreading lens with an elliptical outer curvature and an inner curvature such that light is constrained to leave the lens with a generally equal light intensity at all points on the outer curvature but respectfully disagrees that this would be obvious.

Specifically, the Applicant respectfully disagrees that this change of shape is, in the words of the Examiner, “*not significant to the function of the combination*” and respectfully disagrees that Trett does not teach away from this feature.

The Applicant also respectfully notes that the Examiner’s assertion that one skilled in the art would have been motivated “*to select the shape of [the lens] for the purpose of creating a uniform light output*” because “*the uniformity aids more accurate detection of triggers*” has not been supported by any documentary evidence. Indeed, the assertion is expressly contradicted by the teaching of Trett.

Comments in relation to In re Dailey, 357 F. 2d 669, 149 USPQ 47 (CCPA 1966)

It is inherent to the physical properties of a lens that the relative curvature of its surfaces is fundamental to the way it functions. Thus, unlike the disposable plastic nursing container to which *In re Dailey* related, the relative curvature of the surfaces of a lens is, *de facto*, significant both to a lens’ function in isolation, and to its function in combination with the localized source of light recited in Claim 46. Accordingly, the shape of the lens is not an arbitrary choice which a person of ordinary skill in the art would have found obvious, it is a fundamental design parameter which the inventors in the present application have modified in a non-obvious way to arrive at the invention claimed in Claim 46.

In the present application the significant requirement of the relative curvature is recited explicitly in the claim - “*such that light is constrained to leave the lens with a generally equal light intensity at all points on the outer curvature*”. The outer curvature and inner curvature of the lens is, therefore, “*significant to the function of the combination*” because it is fundamental to the way in which the illuminable element operates.

The general importance of the shape of a lens, and the fact that it is not a simple matter of choice, is reinforced by the teaching of Trett (discussed in more detail below) which discloses a detection system for a doorway in which the light source is deliberately configured to emit light of a non-uniform intensity, which non-uniform intensity is essential for the invention of Trett to address the problem it sets out to solve.

Comments in relation to Trett

In the Examiner’s response to the Applicant’s argument that Trett teaches away from the claimed invention it is stated that “*disclosure of more than one alternative does not constitute a teaching away from any of these alternative because such a disclosure does not criticize, discredit, or otherwise discourage the solution claimed ...*”. It is pointed out, however, that Trett clearly and

unambiguously does *criticize, discredit, or otherwise discourage* the use of a lens which is specifically designed to constrain light to leave the lens with a *generally equal light intensity at all points on the outer curvature*.

In Column 1, lines 23 to 25, Trett, for example, states that the "problem with this arrangement is that *as the distance between the detector and emitter decreases* [i.e. the lift doors close] *the intensity of light received by the detector increases*" basically because it reduces the accuracy of detection.

Accordingly, Trett explicitly *criticizes* systems in which the intensity of light, from an illuminable element located at one side of an elevator doorway, and incident at the opposite side of the doorway increases as the door shuts. As one skilled in the art would understand, the criticized change in intensity is exactly what will occur if an illuminable element having a light spreading lens configured such that "*light is constrained to leave the lens with a generally equal light intensity at all points on the outer curvature*" (as recited in Claim 46) is used. Specifically, if light is constrained to leave the lens of the illuminable element with a generally equal light intensity at all points on the outer curvature, as claimed, it is inherent that the light incident at the opposite side of the doorway will increase as the elevator door closes (which Trett expressly criticizes).

The disclosure of Trett therefore clearly *discredits, or otherwise discourages* use of an illuminable element as Claimed in Claim 46. Furthermore, it clearly contradicts the Examiner's unsupported assertion that "*the uniformity aids more accurate detection of triggers*".

Furthermore, Trett's solution to the stated problem is to vary the intensity of the radiation, as shown in Figure 3 and as recited as an essential feature of Claim 1, in dependence on the angle, relative to the optical axis, with which it leaves the emitter (see, for example, Claim 1 - "... *the radiation intensity transmitted by the emitter and detected by the detector being arranged to vary as a function of said angle [the angle the radiation makes with the optical axis] ...*"). According to Trett, therefore, varying intensity around the outer curvature of the light source is not optional and is not merely one of a plurality of alternatives.

A skilled person reading Trett would therefore have understood that it is not merely optional, but in fact essential that the intensity around the outer curvature of the lens must vary in order to solve the problem taught by Trett. This clearly contradicts the requirement recited in the claim for light to be constrained to leave the lens with a *generally equal light intensity at all points on the outer curvature*.

Accordingly, a skilled person would not have found it obvious to modify the invention of Gray both to include a light-spreading lens and diffuser of Trett and to modify the lens such that such that light is constrained to leave the lens with a generally equal light intensity at all points on the outer curvature (a possibility which is not disclosed in any cited document).

If the Examiner has any further questions or concerns, the Examiner is invited to contact the Applicant's undersigned attorney/agent.

Respectfully submitted,
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